

Claims

1. Method of producing a classification scheme for chemical compounds comprising clustering according to similarity the biochemical response profiles of an organism as determined by exposing said organism for a of period less than one generation time to a multitude of individual chemical compounds.

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2. Method according to claim 1, wherein the metabolism of the organism is quenched directly after said exposing time.

3. Method according to claim 1 or 2, wherein said clustering according to  
10 similarity comprises principal component analysis.

4. Method according to any one of the preceding claims, wherein said chemical compounds are not cytotoxic to mammalian cells.

15 5. Method according to any one of the preceding claims, wherein said organism is susceptible to said individual chemical compounds.

6. Method according to any one of the preceding claims, wherein said chemical compounds are antibiotic compounds.

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7. Method according to any one of the preceding claims, wherein said multitude of individual chemical compounds comprises reference compounds with known mode of action and wherein said profiles are reference response profiles clustered according similarity in mode of action.

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8. Classification scheme for chemical compounds obtainable by a method according to any one of claims 1 to 7.

9. Method of classifying a chemical compound, comprising the steps of:

- a) providing a classification scheme for chemical compounds by performing a method of any one of claims 1-6;
- 5 b) exposing an organism to said chemical compound;
- c) determining the biochemical response profile of said organism, and
- d) determining in said scheme the clustered position of said biochemical response profile.

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10. Method of classifying an antibiotic compound according to mode of action comprising the steps of:

- a) providing a classification scheme for chemical compounds by performing a method of any one of claims 1-6, wherein said chemical  
15 compound is an antibiotic compound, wherein said multitude of individual antibiotic compounds comprises reference compounds with known mode of action and wherein said profiles are reference response profiles clustered according similarity in mode of action;

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- b) exposing an organism to said antibiotic compound;
- 20 c) determining the biochemical response profile of said organism;
- d) determining in said scheme the clustered position of said biochemical response profile, and

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- e) assigning to said antibiotic compound the mode of action of the corresponding cluster of reference response profiles or assigning to said  
25 antibiotic compound a new mode of action in case said position is outside any known cluster of reference response profiles.

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11. Method of analysing a mode of action of an antibiotic compound comprising the steps of:

- a) performing a method of classifying an antibiotic compound according to claim 10, wherein the biochemical response profile is a transcription response profile, thereby determining for said antibiotic compound the clustered position of the transcription response profile;
- 5 b) identifying from said transcription response profile the genes of said organism of which the expression is substantially affected by exposure to said antibiotic compound and which characterize said clustered position, and
- c) determining from the identity of said genes the cellular process
- 10 affected by said antibiotic compound.

12. Method of identifying a new mode of action of an antibiotic compound comprising the steps of:

- a) performing a method of classifying an antibiotic compound according to claim 10, wherein the biochemical response profile is a transcription response profile;
- 15 b) selecting an antibiotic compound of which the corresponding transcription response profile has a clustered position outside any known cluster of reference response profiles;
- 20 c) identifying from the transcription response profile of said selected compound the genes of said organism of which the expression is substantially affected by exposure to said selected antibiotic compound and which characterize said clustered position, and
- d) determining from the identity of said genes the cellular process
- 25 affected by said selected antibiotic compound thereby identifying the new mode of action.

13. Method of identifying the molecular target of an antibiotic compound comprising the steps of:

- 30 a) performing a method according to claim 11 or 12;

- b) selecting a group of potential molecular targets characterizing said cellular process affected by said antibiotic compound, and
- c) identifying the molecular target of said antibiotic compound in said group.

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14. Method of identifying a new metabolic route comprising the steps of:
- a) performing the method according to claim 9, wherein the biochemical response profile is a transcription response profile, wherein said multitude of individual chemical compounds comprises reference compounds with known mode of action and wherein said profiles are reference response profiles clustered according similarity in mode of action;
  - b) selecting a chemical compound of which the corresponding transcription response profile has a clustered position outside any known cluster of reference response profiles;
  - c) identifying from said transcription response profile the genes of said organism of which the expression is substantially affected by exposure to said chemical compound and which characterize said clustered position, and
  - d) determining from the identity of said genes the cellular process affected by said chemical compound thereby identifying a new metabolic route.

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